

# Signal Sketches Summary

You said:



Sketch the following signals:

- a)  $\text{rect}(t+1)/4$
- b)  $5\text{ramp}(0.1t)$
- c)  $(t-1)u(t-1)$  d)  $-u(t-1)$
- e)  $u(t-2) - u(t-2)$

ChatGPT said:



Let's break down the signals one by one before sketching:

a)  $\frac{1}{4}\text{rect}(t+1)$ :

- $\text{rect}(t+1)$ : This is a rectangular pulse centered at  $t = -1$  with a width of 1.
- $\frac{1}{4}$  scales the amplitude by 1/4.

b)  $5 \times \text{ramp}(0.1t)$ :

- $\text{ramp}(t)$ : This is a ramp function that increases linearly with  $t$  (i.e.,  $t$  for  $t \geq 0$  and 0 for  $t < 0$ ).
- $0.1t$  scales the argument, making the ramp function increase more slowly.
- $5$  scales the amplitude by 5.

c)  $(t-1)u(t-1)$ :

- $u(t-1)$ : This is a step function that activates at  $t = 1$ .
- $t-1$ : This linear term starts increasing from 0 at  $t = 1$ .

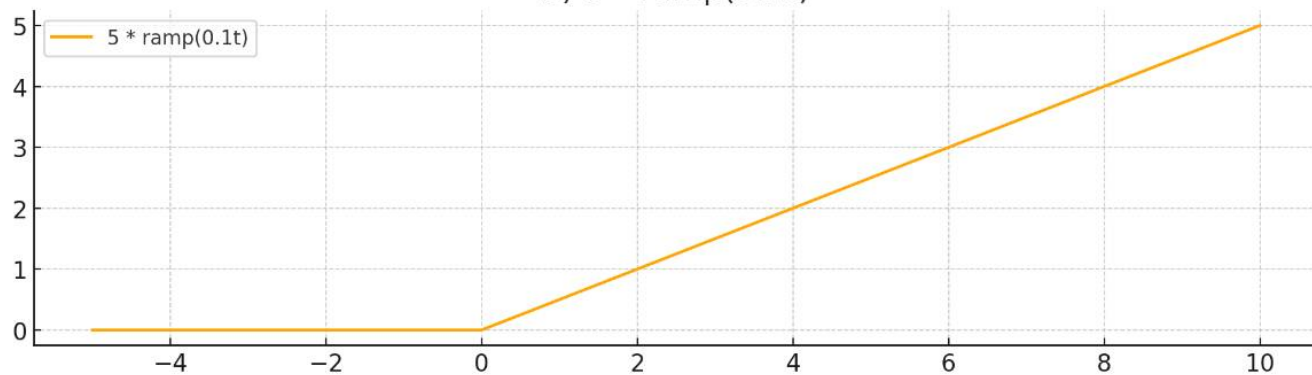
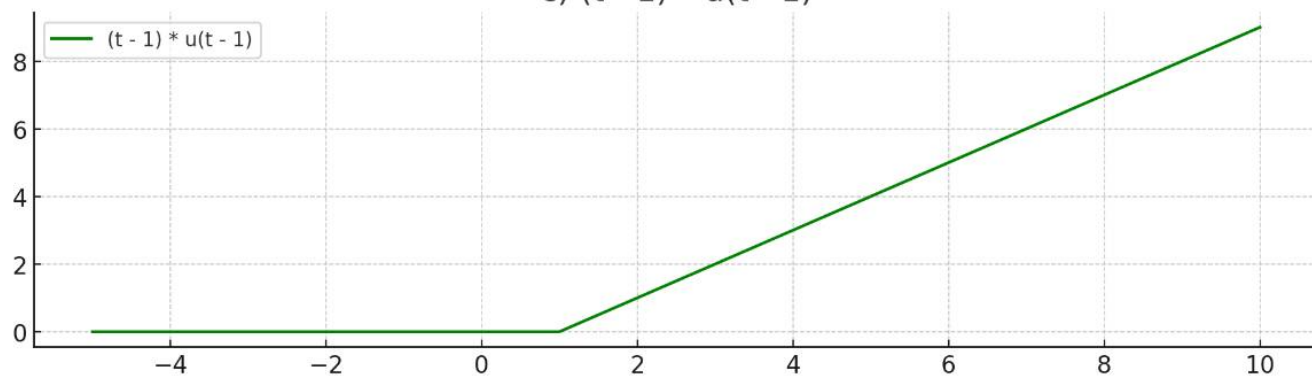
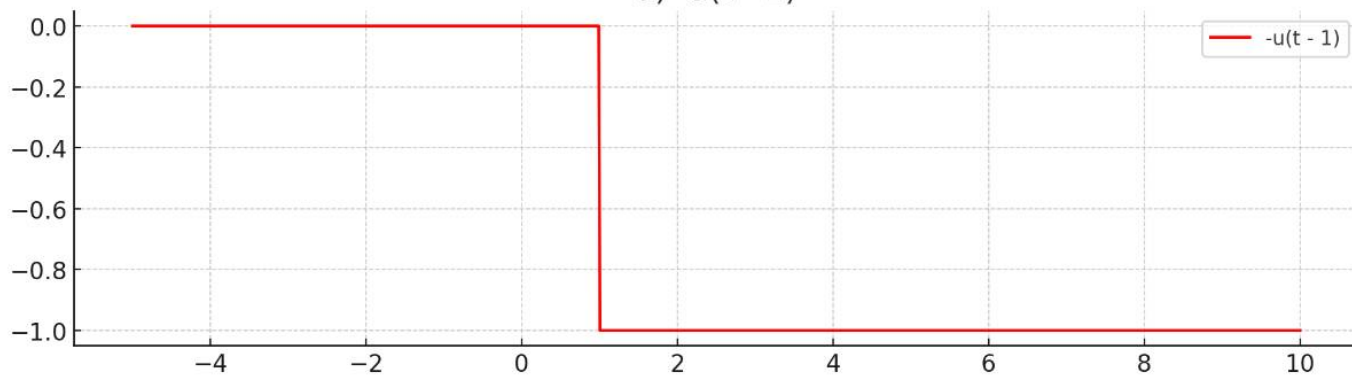
d)  $-u(t-1)$ :

- $u(t-1)$ : This is a step function that activates at  $t = 1$ .
- $-u(t-1)$ : This inverts the step function, making it a negative step that starts at  $t = 1$ .

e)  $u(t-2) - u(t-2)$ :

- This expression simplifies to 0 since  $u(t-2) - u(t-2) = 0$  for all  $t$ .

Given these descriptions, I'll now sketch these signals.

a)  $(1/4) * \text{rect}(t + 1)$ b)  $5 * \text{ramp}(0.1t)$ c)  $(t - 1) * u(t - 1)$ d)  $-u(t - 1)$ e)  $u(t - 2) - u(t - 2)$ 



Here are the sketches for the given signals:

- $\frac{1}{4} \times \text{rect}(t + 1)$ : A rectangular pulse centered at  $t = -1$  with a height of 0.25.
- $5 \times \text{ramp}(0.1t)$ : A ramp function starting from 0 at  $t = 0$ , increasing linearly with a slope of 0.5.
- $(t - 1) \times u(t - 1)$ : A linear function starting from 0 at  $t = 1$ , increasing with a slope of 1.
- $-u(t - 1)$ : A negative step function that activates at  $t = 1$ , remaining constant at  $-1$  for  $t \geq 1$ .
- $u(t - 2) - u(t - 2)$ : This simplifies to 0 for all  $t$ , so it is just a flat line at 0.

You said:



Sketch the signal,  $y[n] = u[n+2] - u[n-3]$ , where  $u[n]$  represents unit step signal

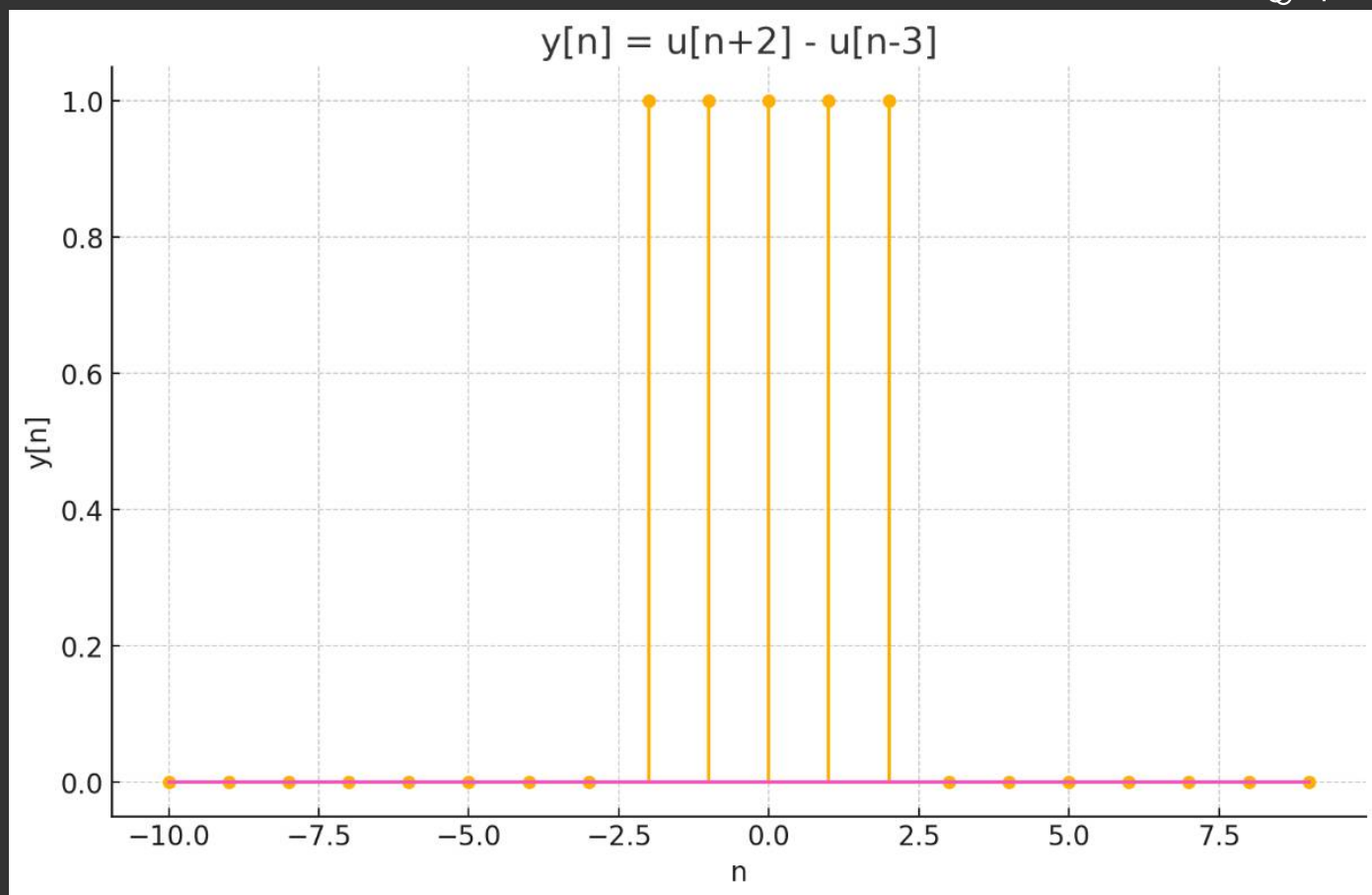
ChatGPT said:



The signal  $y[n] = u[n + 2] - u[n - 3]$  is a difference of two unit step functions. Let's break down and sketch the signal:

- $u[n + 2]$  is a unit step function that shifts the step to  $n = -2$ . It is 0 for  $n < -2$  and 1 for  $n \geq -2$ .
- $u[n - 3]$  is a unit step function that shifts the step to  $n = 3$ . It is 0 for  $n < 3$  and 1 for  $n \geq 3$ .
- The difference  $u[n + 2] - u[n - 3]$  results in a signal that is 1 between  $-2 \leq n < 3$  and 0 otherwise.

I'll now sketch this signal.



Here is the sketch of the signal  $y[n] = u[n+2] - u[n-3]$ :

- The signal is 1 between  $n = -2$  and  $n = 2$  (inclusive), and 0 elsewhere.
- This creates a rectangular pulse that starts at  $n = -2$  and ends just before  $n = 3$ .

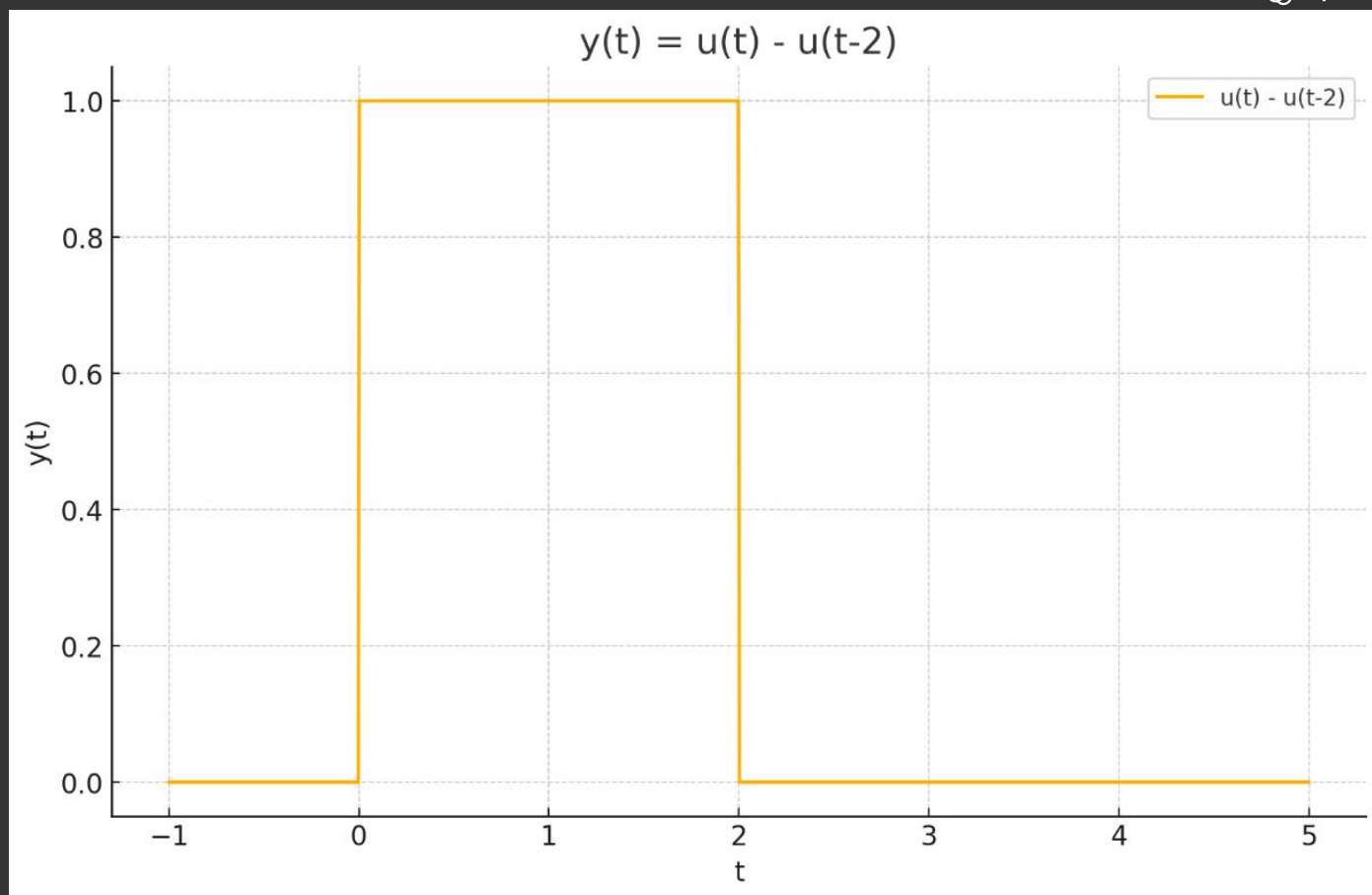
You said:



Sketch the following signal  
 $u(t) - u(t-2)$

ChatGPT said:





Here is the sketch of the signal  $y(t) = u(t) - u(t - 2)$ :

- The signal is 1 between  $t = 0$  and  $t = 2$ , and 0 elsewhere.
- This creates a rectangular pulse that starts at  $t = 0$  and ends at  $t = 2$ .

ChatGPT can make mistakes. Check important info.